MicroLink dLAN™ Wireless

© 2003 devolo AG, Aachen (Germany)

While the information in this manual has been compiled with great care, it may not be deemed an assurance of product characteristics. devolo shall be liable only to the degree specified in the terms of sale and delivery.

The reproduction and distribution of the documentation and software supplied with this product and the use of its contents is subject to written authorization from devolo. We reserve the right to make any alterations that arise as the result of technical development.

You can find all declarations and certifications of compliance for the products, as long as they were available at the time of publication, in the appendix of this documentation.

Trademarks

Windows® and Microsoft® are registered trademarks of Microsoft, Corp.

HomePlug® is a registered trademark of HomePlug Power Alliance.

The devolo logo is a registered trademark of devolo AG. All other names mentioned may be trademarks or registered trademarks of their respective owners.

Subject to change without notice. No liability for technical errors or omissions.

devolo AG
Sonnenweg 11
52070 Aachen
Germany

www.devolo.com

Aachen, November 2003

40195/1103

Preface

Thank you for placing your trust in this devolo product.

Wireless networks are economical alternatives or additions to local wired networks like for instance the dLAN networks. Notebooks and PCs can use mobile network cards to communicate with one another or access wired networks via access points. As a HomePlug access point with wireless output, the MicroLink dLAN Wireless functions as the interface between a wireless network and a dLAN network.

The MicroLink dLAN Wireless is compatible with the HomePlug standard and allows you to expand your home network easily and cost-effectively. Encryption in both the HomePlug and wireless units guarantees the highest degree of protection from interception.

About this manual

This manual contains all the information you need about your MicroLink dLAN Wireless from devolo. It tells you how to set up and install your dLAN adapter. You also find examples of applications for the MicroLink dLAN Wireless and general information on networks.

Exacting manufacturing standards and stringent quality control are the basis for high product standards and consistent quality to ensure your fullest satisfaction with this dLAN adapter.

This documentation was compiled by several members of our staff from a variety of departments in order to ensure you the best possible support when using your product.

Additional information in the Internet at 'www.devolo.com'

Our online services (www.devolo.com) is available to you around the clock should you have any queries or require any further support.

Package contents

Please ensure that the delivery is complete before beginning with the installation of your MicroLink dLAN Wireless:

- MicroLink dLAN Wireless including the built-in wireless card

Before starting up the MicroLink dLAN Wireless, make sure that the wireless card is correctly inserted into the unit.

- Manual (hard copy)
- CD with drivers, online documentation and application software

devolo reserves the right to change the package contents without prior notice.

CE conformity

This product complies with the technical requirements of the 1999/5/EC Directive (R&TTE) and the other relevant provisions of the FTEG, and it is designed for use in the EU and Switzerland.

This product is class A equipment. This equipment may cause interference with radio waves in home use; if this occurs the operator may be required to take corrective action.

This wireless device transmits and receives radio signals. During the installation and utilisation of this device, please ensure that there is a distance of at least 20 cm between the device and your body.

See the appendix to this manual for the declaration of conformity to the applicable standards.

Content

1 Introduction 7
1.1 What exactly is dLAN? 7
1.2 The basic functions of a wireless network 8
1.3 What does the MicroLink dLAN Wireless have to offer? 8
1.3.1 Operating modes 9
1.3.2 MicroLink dLAN Wireless 9

2 Connection and startup 10
2.1 System requirements 10
2.2 Connection and display elements 10
2.3 Connecting the MicroLink dLAN Wireless 11

3 devolo MicroLink dLAN Software 12
3.1 MicroLink dLAN Configuration Wizard 12
3.2 MicroLink Informer 12
3.3 MicroLink EasyShare 12
3.3.1 Installing the devolo MicroLink dLAN Software 14

4 Network configuration 15
4.1 Configuring the dLAN network 15
4.2 Configuring the MicroLink dLAN Wireless on the WLAN network 16
4.2.1 General notes 16
4.2.2 How do I access the configuration interface? 19
4.2.3 Setup 20
4.2.4 Status 25
4.2.5 Tools 26
4.2.6 Advanced 27

5 All about the home network 30
5.1 Configuring the computer 30
5.1.1 Windows 98 and Windows Me 30
5.1.2 Windows 2000 30
5.1.3 Windows XP 31
5.2 Examples of applications 32
5.2.1 WLAN individual installation solution—Option 1 32
5.2.2 Home networking—Option 2 32
5.3 Worth knowing 33

6 Appendix 35
6.1 Technical data 35
6.2 Declaration of conformity 36
6.3 Warranty conditions 37

EN

1 Introduction

In this chapter, we will provide an overview of HomePlug (dLAN) and wireless technology (WLAN). We will also proved a brief introduction of the most important features of the MicroLink dLAN Wireless access point.

1.1 What exactly is dLAN?

There is now a new alternative to the well-known wired LAN and Wireless LAN network technologies currently used in home networking: dLAN (**d**irect **LAN**, i.e. directly networked). dLAN is home networking using the electric wiring already installed in the building.

Cost factor and transmission quality

dLAN is an economical and easy-to-use networking technology. You don't need to lay cables and you can connect to the home network at every power point.

The dLAN technology modulates and demodulates additional frequencies on the power lines. Modulation and demodulation is a well-known and proven method of data transmission, which has been in use in other applications for a number of years. Now it is used to set up Internet and network accesses in the home or office. Depending on the damping factor, distances of up to 200 meters can be covered.

With a maximum data transmission rate of 14 Mbps and symmetrical upload and download, the dLAN technology is equivalent to classical Ethernet networking solutions and is faster than the current wireless standard WiFi™ for home applications. Depending on the line quality, bandwidths of 6 to 8 Mbps are possible in practice—quite sufficient for extending a DSL connection into every room.

Data security and radiation

The power meter in the building acts as a physical barrier against unwanted access from outside. In addition, for the sake of security, a 56-bit encryption is used to guarantee secure data transfer within the network.

dLAN devices from devolo meet the stringent EU industrial standards and comply with the current standards for electromagnetic radiation.

EN

1.2 The basic functions of a wireless network

In a wireless network, you use wireless networking cards to connect individual notebook computers and PCs to a LAN (**L**ocal **A**rea **N**etwork). As the usual network cables have been replaced by a radio link in this case, we also refer to this as a **W**ireless **L**ocal **A**rea **N**etwork (WLAN).

An access point forms the bridge between (d)LAN and WLAN. The access point transfers all data between the two networks.

The maximum area in which wireless network adapters in mobile stations and the access point can reach each other and exchange data is known as a radio cell. All the functions of a wired network are available in a wireless network.

Data security

The WEP (**W**ired **E**quivalent **P**rivacy) encryption method attaches a 128-bit key to the wireless data, ensuring the secure transfer of data within the network.

1.3 What does the MicroLink dLAN Wireless have to offer?

Equipped with a wireless interface, the MicroLink dLAN Wireless access point allows a home network to be built both over the existing power supply system and wirelessly: PC tasks such as data exchange, access to a shared printer on the home network and Internet access are performed over the existing electrical wiring of the home. Network links in conferences, access to resources in adjacent buildings and exchanging data with mobile units are only a few of the options available with a wireless LAN.

The advantages of a combination of these two network cards are obvious: using dLAN adapters, every available electrical outlet can be used to connect your computers to your home network. This makes you completely mobile—from the basement to the attic, everything is transmitted through your power outlets. In a wireless LAN, PCs and notebooks can be set up wherever they are most useful—here, too, problems with unavailable network connections are a thing of the past.

1.3.1 Operating modes

The following operating modes can be selected when using the MicroLink dLAN Wireless access point:

- Wireless stand-alone network:
  Setting up a wireless stand-alone network without any wired networking is the simplest application offered by the access point. In this setup, the MicroLink dLAN Wireless serves as a relay station between the wireless clients. It enables data transfer between all clients located in the radio cell surrounding the access point.
- WLAN-to-dLAN adapter
  Your MicroLink dLAN Wireless functions as a WLAN-to-dLAN adapter when connected to an existing dLAN network. In this setup, the MicroLink dLAN Wireless connects the wireless network clients to the cabled network (dLAN).

1.3.2 MicroLink dLAN Wireless

Simple installation

- Connect MicroLink dLAN Wireless to the power supply system
- Install the devolo MicroLink dLAN Software
- Configure the dLAN network and the wireless network
- That's it!

Connections

The MicroLink dLAN Wireless has a built-in wireless card as well as a European power plug for connecting it to the power supply system. Power is fed to the adapter over an integrated 230V AC power supply.

Status display

The control lamps (LEDs) of your MicroLink dLAN Wireless display the connection status, and provide status regarding the function of the data transmission. The MicroLink dLAN Wireless has 5 control lamps and a wireless card.

EN

2 Connection and startup

In this chapter, we will show you how to connect the MicroLink dLAN Wireless access point by devolo.

2.1 System requirements

Your computer or laptop must meet the following requirements to operate with your MicroLink dLAN Wireless:

- **Operating systems**: Windows 98, Windows Me, Windows 2000, Windows XP or all TCP/IP systems

2.2 Connection and display elements

The MicroLink dLAN Wireless access point has five control lights (LEDs) and a built-in wireless card:

- **WLAN**
  - **Tx:** Lights up when data are being sent from the dLAN to the WLAN.
  - **Rx:** Lights up when data are being sent from the WLAN to the dLAN.

EN

- **dLAN**
  - **Link:** Lights up if connected to the power supply.
  - **Col:** Flashes at a faster rate if the network is experiencing heavy use.
  - **Act:** Flashes when data are being sent or received over the power lines.

2.3 Connecting the MicroLink dLAN Wireless

Before connecting the dLAN adapter, note its security ID and keep it ready for configuring the network. You can find the security ID on the bottom of the MicroLink dLAN Wireless adapter.

① Insert the MicroLink dLAN Wireless adapter into an available electrical outlet.

No drivers are required for running the MicroLink dLAN Wireless.

② For further information on installing the devolo tools, please refer to the chapter on 'devolo MicroLink dLAN Software'.

EN

3 devolo MicroLink dLAN Software

In this chapter, we will introduce to you the MicroLink dLAN Configuration Wizard, MicroLink Informer and MicroLink EasyShare devolo tools, and describe how to install them in the section entitled, 'Installing the devolo MicroLink dLAN Software'.

3.1 MicroLink dLAN Configuration Wizard

The MicroLink dLAN Configuration Wizard helps you to build and change your encrypted dLAN network. With its help, you can add the MicroLink dLAN Wireless to your network. It allows you to configure all dLAN adapters on the network from a central location, such as from a single workstation. For the encryption process, you need the security ID of the MicroLink dLAN Wireless (provided on the underside of unit) and a network password of your choosing, which you will assign.

*The password set up initially by devolo is **HomePlug**.*

For information on configuring the MicroLink dLAN Configuration Wizard or your dLAN network, refer to the chapter on 'Network configuration'.

3.2 MicroLink Informer

The MicroLink Informer displays information about all dLAN devices in your network, such as their MAC addresses and current transfer speeds.

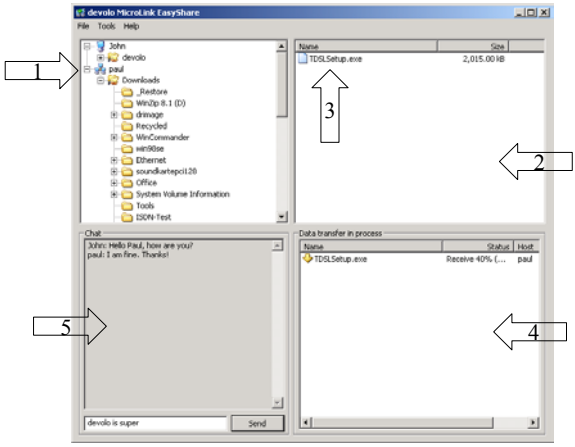
*The MAC address (**M**edia **A**ccess **C**ontrol) is a serial number which is unique throughout the entire world. It is permanently programmed in the hardware and cannot be altered. You can find the MAC address of the dLAN adapter on the bottom of the unit.*

3.3 MicroLink EasyShare

MicroLink EasyShare is a file-sharing and chat tool for your local network. It allows you to exchange files easily between local Windows computers. The chat function allows instant communication between all network users. MicroLink EasyShare is very user-friendly and easy to use. All users on the

EN

local network who have started MicroLink EasyShare are automatically recognized by the program and listed:



① In the 'Share properties' dialog window, which you can open by selecting **File** ▶ **Add share**, select one (or more) folders from your hard drive to be shared with the other network users. Then assign a name to the folder.

② Select from the menu **File** ▶ **Refresh** to display (new) shared folders of other MicroLink EasyShare network users. The contents of all shared folders appear in the upper right window.

③ If you want to download files from folders being shared by other MicroLink EasyShare network users, mark the selected file of the corresponding folder and select **File** ▶ **Download** from the menu. Specify a target directory on your computer.

④ All 'Data transfer in process' are displayed in the lower right window and disappear from the screen once they are finished.

⑤ The lower left window functions as a chat room, which is visible and accessible to all MicroLink EasyShare users on the local network. Users can "chat" by writing messages and clicking **Send**.

All menu options can be selected using the right mouse button.

EN

3.3.1 Installing the devolo MicroLink dLAN Software

① Put the enclosed devolo product CD in your CD-ROM drive.

② From the CD setup, select 'Install MicroLink dLAN Software'. Windows starts the wizard. Confirm by clicking **Next**.

③ Select the devolo tools ('devolo MicroLink dLAN Configuration Wizard', 'devolo MicroLink Informer' and/or 'devolo MicroLink EasyShare') you want to install, and then click **Next**.

④ The next dialog window shows the default target directory (preset by devolo), to which the devolo tools will be installed. You can accept the suggested directory or select a new one. Confirm your selection by clicking **Next**.

⑤ Confirm once again by clicking **Next**, then end the installation by clicking **Finish**.

⑥ After the installation has been completed successfully, start the devolo tools by clicking **Start** ▶ **Programs** ▶ **devolo** ▶ **MicroLink dLAN Configuration Wizard**, **MicroLink EasyShare** or **MicroLink Informer**.

For information on configuring your dLAN and WLAN network, please refer to the chapter on 'Network configuration'.

EN

4 Network configuration

In this chapter, we will explain the functions and settings of your dLAN and WLAN network and guide you through the configuration interface of the MicroLink dLAN Wireless. In addition, please refer to our general notes regarding networking options.

Some of the fields, options and entries used in the configuration interface are self-explanatory, and thus are not explained in great detail. Detailed explanations are provided for all items requiring elaboration. If you have any other questions about technical terms and scenarios, please refer to our web site at www.devolo.com. Our devolo lexicon and the frequently asked questions (FAQ) are also provided on your devolo product CD.

4.1 Configuring the dLAN network

Please have at hand the security ID of the MicroLink dLAN Wireless, which you have written down earlier. The MicroLink dLAN Configuration Wizard requires this for configuring the network. You can find the security ID on the bottom of the unit.

① Start the MicroLink dLAN Configuration Wizard by clicking **Start** ▶ **Programs** ▶ **devolo** ▶ **MicroLink dLAN Configuration Wizard**.

② Confirm with **Next**.

③ The MicroLink dLAN Configuration Wizard starts the network analysis and searches your network for the MicroLink dLAN Wireless.

④ Now enter the security ID of the MicroLink dLAN Wireless and click **Add**. Confirm with **Next**.

⑤ In the next dialog window, enter the network password you have chosen and confirm with **Next**.

*The password set up initially by devolo is **HomePlug**.*

Make sure that all of the dLAN adapter units that you want to add to your network are also connected physically.

⑥ Your network password is now (re-)assigned to all registered adapters.

⑦ Finish the process of protecting your network by clicking **Finish**.

Also follow the general notes on configuring the WLAN network.

EN

4.2 Configuring the MicroLink dLAN Wireless on the WLAN network

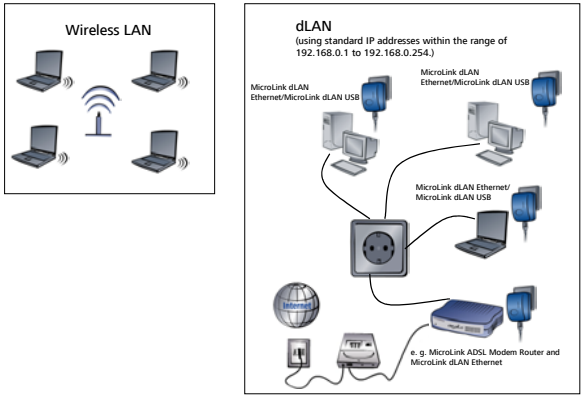
4.2.1 General notes

When first delivered, the MicroLink dLAN Wireless access point is set to static IP address '192.168.0.252'. If you are already running a network which you want to expand using the MicroLink dLAN Wireless, you may have to change the IP address to that of your existing network. The following are explanations of the most common network situations:

Scenario 1:

You are already running a local network with a devolo router.

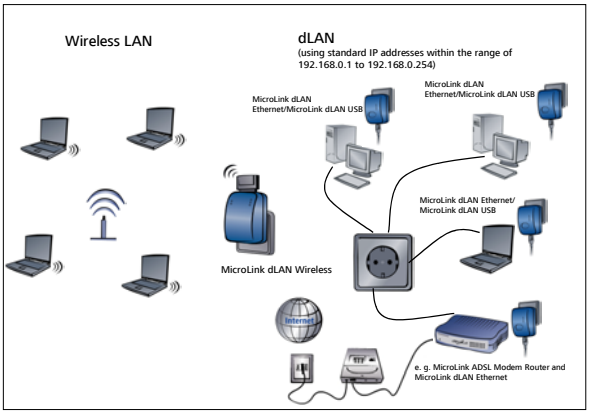
Before



All devolo network devices operate using standard IP addresses within the range of 192.168.0.1 to 192.168.0.254. If you have **not** made any changes to this setting, the MicroLink dLAN Wireless is recognized automatically by the

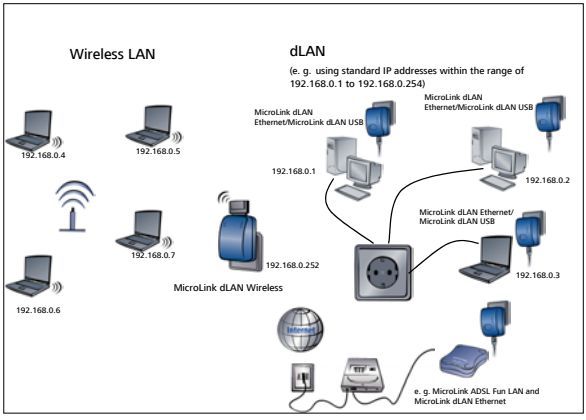
network. If this is the case, you can simply skip ahead to the section entitled, 'How do I access the configuration interface?'.

After



Scenario 2:

You are already running a local network without a DHCP server (e. g. router).



In this case, we recommend either assigning static IP addresses within the IP address range 192.168.0.1 to 192.168.0.254 to all computers on the LAN or adapting the MicroLink dLAN Wireless to the existing IP address range (e.g. 10.x.x.x) of your network. In the latter case we recommend the following procedure: Temporarily rename the IP address of the computer from which you

EN

want to configure the access point to an IP address in the range between 192.168.0.1 and 192.168.0.254.

For information on how to assign a static IP address to your computer, refer to the chapter 'All about the home network' under 'Configuring the computer'.

Open the configuration interface as described under 'How do I access the configuration interface?' and change the IP address of the MicroLink dLAN Wireless to the one you have chosen in the configuration menu under 'IP Address'.

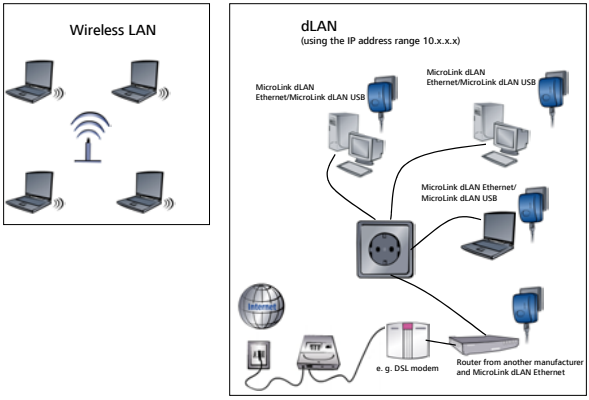
Also refer to the menu description in the section entitled, 'Advanced'.

Next, restore the computer which you have just renamed to its previous IP address. Since all devices on the LAN now belong to the same address range (again), they can be recognized without problem.

Scenario 3:

You are already operating a local network using a router from another manufacturer that uses a different IP address range, e.g. 10.x.x.x.

Before



In this case, we recommend the following procedure: Temporarily rename the IP address of the computer from which you want to configure the access point to an IP address in the range between 192.168.0.1 and 192.168.0.254.

For information on how to assign a static IP address to your computer, refer to the chapter 'All about the home network' under 'Configuring the computer'.

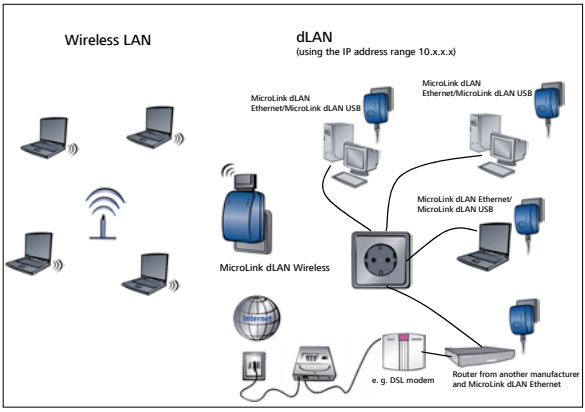
EN

Open the configuration interface as described above and change the IP address of the MicroLink dLAN Wireless to the one you have chosen in the configuration menu under 'IP Address'.

Also refer to the menu description in the section entitled, 'Advanced'.

Next, restore the computer which you have just renamed to its previous IP address. Since all devices on the LAN now belong to the same address range (again), they can be recognized without problem.

After


Wireless LAN
dLAN
(using the IP address range 10.x.x.x)
MicroLink dLAN Ethernet/MicroLink dLAN USB
MicroLink dLAN Ethernet/MicroLink dLAN USB
MicroLink dLAN Ethernet/ MicroLink dLAN USB
MicroLink dLAN Wireless
Internet
e. g. DSL modem
Router from another manufacturer and MicroLink dLAN Ethernet

4.2.2 How do I access the configuration interface?

To configure the MicroLink dLAN Wireless on your WLAN network, manually enter the address 'http://192.168.0.252' in your Internet browser, or create a direct shortcut to this address in the Start menu or on your Desktop. This is how you should proceed:

① For CD setup select 'Start Setup Wizard'.

② The 'MicroLink dLAN Wireless Setup' dialogue window appears. Start the setup by clicking on **Start Setup**.

③ After the installation has been completed successfully, open the configuration interface of the dLAN adapter by clicking **Start** ▶ **Programs** ▶ **devolo** ▶ **MicroLink dLAN Wireless Setup** or by clicking the 'MicroLink dLAN Wireless Setup' icon on your desktop.

The default language setting for the menus is based on the language version of your web browser. The menu language of the MicroLink dLAN Wireless

EN

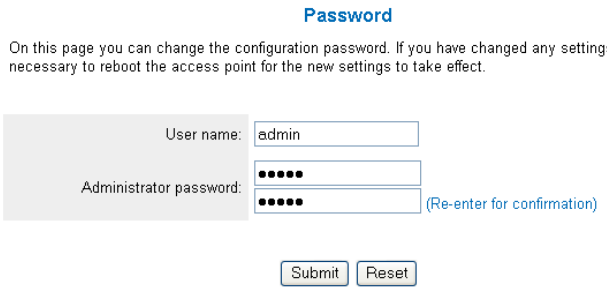
(German/English) can be toggled by clicking the corresponding flags on the start page of the configuration interface.

4.2.3 Setup

Admin Password

*The password of the configuration interface set up initially by devolo is **admin**.*

The Admin password is the configuration password. Select a new password and enter it into both input fields. This ensures that no one can change the configuration of your MicroLink dLAN Wireless without authorization. The password must have at least five characters, and may only consist of letters and numbers. Should you ever forget your password, you will need to press the 'Reset' button of the MicroLink dLAN Wireless. **However, this will delete all of your configuration data and you will need to repeat the configuration procedure.** After a reset, the password will be **admin** again.

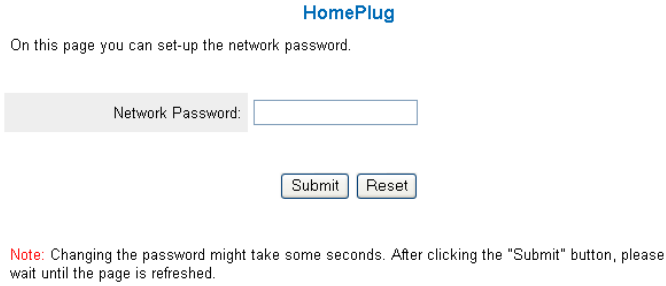

Password
On this page you can change the configuration password. If you have changed any settings it is necessary to reboot the access point for the new settings to take effect.
User name:
admin
Administrator password:
(Re-enter for confirmation)
Submit
Reset

*Keep in mind that the settings you have configured take effect only if you confirm them by clicking **Submit** and restart the access point.*

EN

Homeplug

Enter the password of your dLAN network, so that both of your networks, the dLAN and the WLAN, can communicate with each other.


HomePlug
On this page you can set-up the network password.
Network Password:
Submit
Reset
Note: Changing the password might take some seconds. After clicking the "Submit" button, please wait until the page is refreshed.

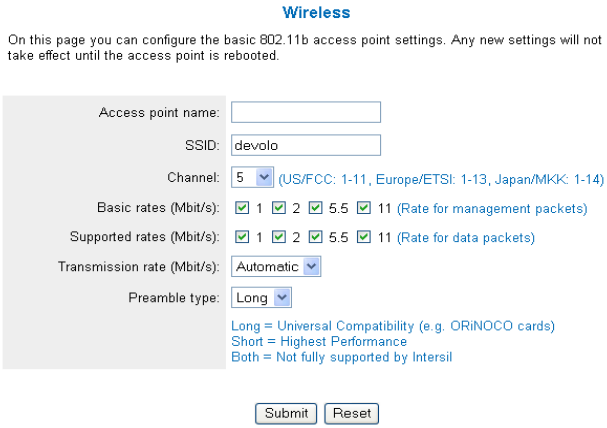
*If your MicroLink dLAN Wireless has already been configured with the help of the MicroLink dLAN Configuration Wizard (see above), and you have already set the password, it is not necessary to set the dLAN password again. The password initially provided by devolo is **HomePlug**.*

*Keep in mind that the settings you have configured only take effect if you confirm them by clicking **Submit** and restart the access point.*

EN

Wireless

Under 'Wireless', you can find important WLAN-related settings for your access point:


Wireless
On this page you can configure the basic 802.11b access point settings. Any new settings will not take effect until the access point is rebooted.
Access point name:
SSID:
devolo
Channel:
5
(US/FCC: 1-11, Europe/ETSI: 1-13, Japan/MKK: 1-14)
Basic rates (Mbit/s):
1 2 5.5 11 (Rate for management packets)
Supported rates (Mbit/s):
1 2 5.5 11 (Rate for data packets)
Transmission rate (Mbit/s):
Automatic
Preamble type:
Long
Long = Universal Compatibility (e.g. ORiNOCO cards)
Short = Highest Performance
Both = Not fully supported by Intersil
Submit
Reset

- 'Access point name': Here you can assign your access point a name that is meaningful to you (such as "Office").
- 'SSID': The Service Set Identity includes all devices belonging to the wireless network, i.e. so that only devices with an identical SSID can communicate directly with each other.
- 'Channel': Here, you can enter the channel for the MicroLink dLAN Wireless to use for sending and receiving (default setting: 1).
- 'Basic rates (Mbps)': This is the minimum data transfer rate, which every computer on the network must achieve so as to communicate with other devices on the LAN (default setting: all active).
- 'Supported rates (Mbps)': Maximum data rate supported by the MicroLink dLAN Wireless (default setting: all active).
- 'Transmission rate': Rate at which the access point sends data.
- 'Preamble type': The 'Long' setting assures the greatest compatibility with all available remote parties. The 'Short' setting can raise the data transfer rate; however, interoperability with all remote parties cannot be guaranteed.

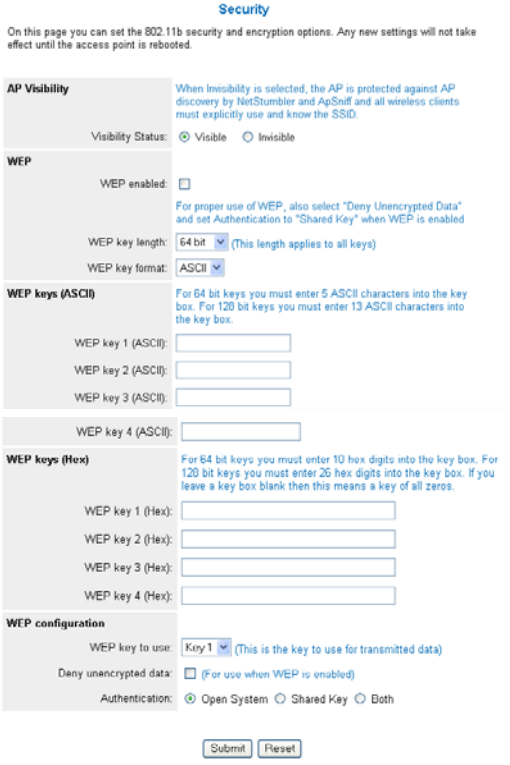
*Keep in mind that the settings you have configured only take effect if you confirm them by clicking **Submit** and restart the access point.*

EN

Security

Please also note the explanations on the configuration interface.

Here, you can define the keys and settings which secure your entire wireless network. The MicroLink dLAN Wireless supports data encryption according to the WEP (**W**ired **E**quivalent **P**rivacy) method. You can decide whether to define the various keys alphanumerically (ASCII code) or hexadecimally.


Security
On this page you can set the 802.11b security and encryption options. Any new settings will not take effect until the access point is rebooted.
AP Visibility
When Invisibility is selected, the AP is protected against AP discovery by NetStumbler and ApSniff and all wireless clients must explicitly use and know the SSID.
Visibility Status: Visible Invisible
WEP
WEP enabled:
For proper use of WEP, also select "Deny Unencrypted Data" and set Authentication to "Shared Key" when WEP is enabled
WEP key length: 64 bit (This length applies to all keys)
WEP key format: ASCII
WEP keys (ASCII)
For 64 bit keys you must enter 5 ASCII characters into the key box. For 128 bit keys you must enter 13 ASCII characters into the key box.
WEP key 1 (ASCII):
WEP key 2 (ASCII):
WEP key 3 (ASCII):
WEP key 4 (ASCII):
WEP keys (Hex)
For 64 bit keys you must enter 10 hex digits into the key box. For 128 bit keys you must enter 26 hex digits into the key box. If you leave a key box blank then this means a key of all zeros.
WEP key 1 (Hex):
WEP key 2 (Hex):
WEP key 3 (Hex):
WEP key 4 (Hex):
WEP configuration
WEP key to use: Key 1 (This is the key to use for transmitted data)
Deny unencrypted data: (For use when WEP is enabled)
Authentication: Open System Shared Key Both
Submit
Reset

- 'AP-Visibility':
  - Under 'Visibility Status', define whether you want the MicroLink dLAN Wireless to be 'Visible' or 'Invisible' to other WLAN devices, including those outside the local network.
- 'WEP':
  - 'WEP enabled': Activating encryption
  - 'WEP key length': 64 bit or 128 bit
  - 'WEP key format': ASCII or hexadecimal

EN

Many WEP-compatible wireless LAN devices from other manufacturers only accept a hexadecimal format for the key or even generate their own special key values on the basis of user-defined passwords. You may have trouble entering a key that accepts your MicroLink dLAN Wireless without a problem, when using a device from another manufacturer. In this case, we recommend that you use the key of the less flexible device for the connection.

- 'WEP keys':
  - 'WEP key': Enter key
- 'WEP configuration':
  - 'WEP key to use': Selecting a key for sending data.
  - 'Deny unencrypted data': Should also be activated when encryption has been activated.
  - 'Authentication':
    'Open System': No authentication, i.e. network stations without keys are accepted
    'Shared Key': Authentication, i.e. only network stations with keys are accepted. This option should also be activated when encryption has been activated.
    'Both': Network stations with and without keys are accepted.

Keep in mind that the settings you have configured only take effect if you confirm them by clicking ***Submit*** *and restart the access point.*

General notes regarding WEP encryption:

- *All devices on the wireless network use one or more common keys to communicate with each other.*
- *To give computers with 64-bit encryption access to the MicroLink dLAN Wireless, the encryption of the access point must be set to 64 bit.*
- *Valid key characters:*
  - *ASCII code: An alphanumeric character string consists of digits between '0-9' and letters from 'a-z'; the letters are case sensitive. For 64 bit 5 alphanumeric characters must be entered, for 128 bit 13 are entered.*
  - *Hexadecimal code: A hexadecimal character string consists of digits between '0-9' and letters between 'a-f'. For 64 bit 10 hexadecimal numbers must be entered, for 128 bit 26 are entered.*
- *Special characters of any kind are not valid.*

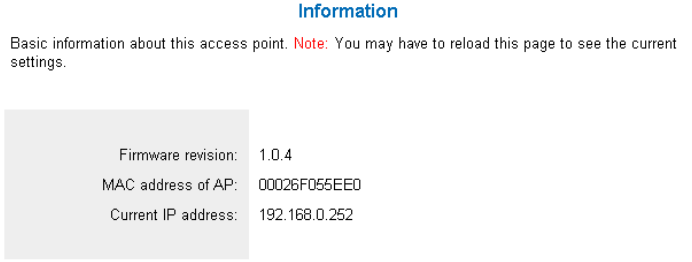
EN

Note that only those devices having an identical WEP setting and SSID can communicate with the MicroLink dLAN Wireless. Also, some wireless cards have the ability to search for the access point. You must select the encrypted transmission to avoid this.

4.2.4 Status

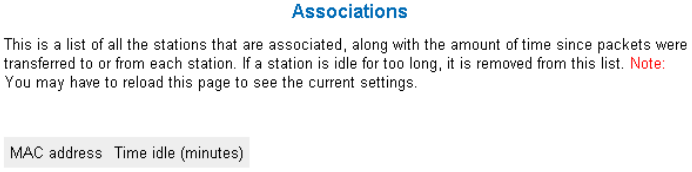
Information

Under 'Information', you can find information on the current firmware version, as well as the MAC and IP address.


Information
Basic information about this access point. Note: You may have to reload this page to see the current settings.
Firmware revision: 1.0.4
MAC address of AP: 00026F055EE0
Current IP address: 192.168.0.252

Associations

Under 'Associations', you can see which network users are logged on to the access point.

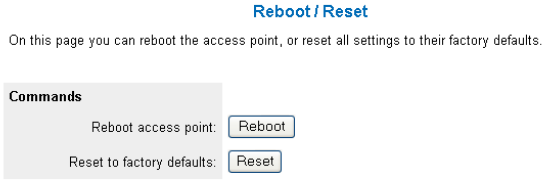

Associations
This is a list of all the stations that are associated, along with the amount of time since packets were transferred to or from each station. If a station is idle for too long, it is removed from this list. Note: You may have to reload this page to see the current settings.
MAC address
Time idle (minutes)

EN

4.2.5 Tools

Reboot/Reset

You can use 'Reboot/Reset' to restart the MicroLink dLAN Wireless. You will have two options:.


Reboot / Reset
On this page you can reboot the access point, or reset all settings to their factory defaults.
Commands
Reboot access point:
Reboot
Reset to factory defaults:
Reset

- **Reboot**:The access point will restart and the configuration data will be retained.
- The option **Reset** has exactly the same effect as the 'Reset' button: **All configuration data will be lost, and it will be necessary to repeat the configuration**.

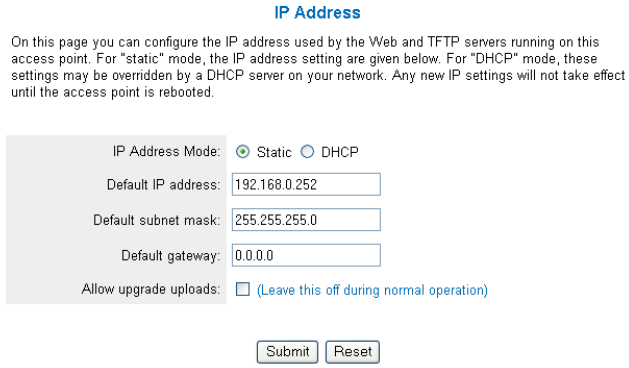
*The password of the configuration interface set up initially by devolo is **admin**.*

EN

4.2.6 Advanced

IP Address

Under 'IP Address', you can find all current settings for the IP address of the access point. Whether you work with static or dynamic IP addresses depends on the configuration of your network.


IP Address
On this page you can configure the IP address used by the Web and TFTP servers running on this access point. For "static" mode, the IP address setting are given below. For "DHCP" mode, these settings may be overridden by a DHCP server on your network. Any new IP settings will not take effect until the access point is rebooted.
IP Address Mode:
Static
DHCP
Default IP address:
192.168.0.252
Default subnet mask:
255.255.255.0
Default gateway:
0.0.0.0
Allow upgrade uploads:
(Leave this off during normal operation)
Submit
Reset

- 'Static': The initial IP address of the MicroLink dLAN Wireless access point at the time of delivery is '192.168.0.252'.
- 'DHCP': Functions as a DHCP client; if you are running a router or DHCP server on your network, which assigns the IP addresses, the MicroLink dLAN Wireless can function as a DHCP client.

Also refer to the section 'General notes' at the beginning of this chapter.

- 'Allow upgrade upload': Should only be activated for downloading new firmware, and should be deactivated for normal operation (default setting: deactivated).

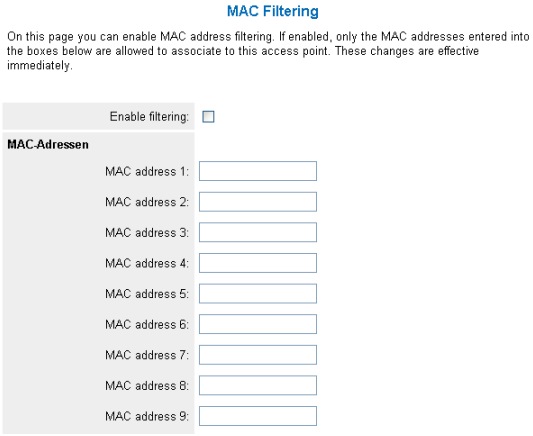
*Keep in mind that the settings you have configured only take effect if you confirm them by clicking **Submit** and restart the access point.*

MAC Filtering

Under 'MAC Filtering', you can activate an additional security filter for your WLAN network by entering the MAC addresses of the WLAN devices that are to have access to the MicroLink dLAN Wireless. To do so, enable the 'Enable

EN

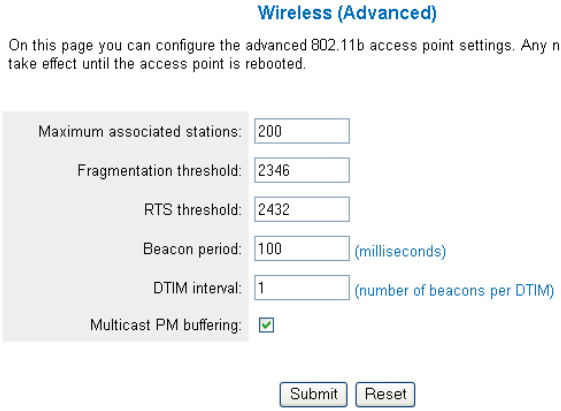
filtering' option and list the addresses of the corresponding devices. You can enter up to sixteen addresses.


MAC Filtering
On this page you can enable MAC address filtering. If enabled, only the MAC addresses entered into the boxes below are allowed to associate to this access point. These changes are effective immediately.
Enable filtering:
MAC-Adressen
MAC address 1:
MAC address 2:
MAC address 3:
MAC address 4:
MAC address 5:
MAC address 6:
MAC address 7:
MAC address 8:
MAC address 9:

*Keep in mind that the settings you have configured only take effect if you confirm them by clicking **Submit** and restart the access point.*

Wireless

These functions are advanced functions which have been preset for optimal use. Normally, it is not necessary to modify these settings.


Wireless (Advanced)
On this page you can configure the advanced 802.11b access point settings. Any new settings will not take effect until the access point is rebooted.
Maximum associated stations: 200
Fragmentation threshold: 2346
RTS threshold: 2432
Beacon period: 100 (milliseconds)
DTIM interval: 1 (number of beacons per DTIM)
Multicast PM buffering:
Submit
Reset

- 'Maximum associated stations': Maximum number of WLAN stations you can connect (default setting: 200).

EN

- 'Fragmentation threshold': Lists the number of bytes that defines the fragmentation limit for direct messages; the purpose of the limit is to make data transfer more secure and reliable. This occurs by dividing a MAC Service Data Unit (MSDU) into multiple, smaller MAC Protocol Data Units (MPDUs). If the size of the transfer packages is too large, serious malfunctions can result. However, too small of a frame produces a backlog during transfer (default setting: 2346 bytes).
- 'RTS threshold': **R**equest **T**o **S**end is part of a virtual collision mechanism on the MAC level; the station which is ready to send informs the target station of how long it will make use of the access point to send data (default setting: 2342 bytes).
- 'Beacon period': The MicroLink dLAN Wireless is a "beacon" for the current exchange of data. On a regular basis, it sends "beacon frames" to all stations, which contain, among other things, a time span (default setting: 100 milliseconds). In order not to disturb a current data transfer, the stations may not use the MicroLink dLAN Wireless during this period.
- 'DTIM': **D**elivery **T**raffic **I**ndication **M**ap; List of broadcast/multicast recipients, transmitted by the access point.

*Keep in mind that the settings you have configured only take effect if you confirm them by clicking **Submit** and restart the access point.*

EN

5 All about the home network

This chapter contains important and useful information on networks—from the configuration of your computer to examples of applications to general tips.

5.1 Configuring the computer

In this section we show you how to configure your computer correctly and how to check existing settings.

5.1.1 Windows 98 and Windows Me

① Open the properties of the LAN connection on the connected computers by selecting **Start** ▶ **Settings** ▶ **Control Panel** ▶ **Network**.

② Click the entry for the TCP/IP protocol of the network adapter and on **Properties**. Enable the 'Specify an IP address' option and enter the 'IP address' and 'Subnet mask'. You can ignore all other options: they either remain empty or retain their default settings. Close the dialogs with **OK**.

*If you cannot find an entry similar to 'TCP/IP' or 'TCP/IP -> Network Adapter Name' or 'Internet Protocol (TCP/IP)', you must install the TCP/IP protocol. Under **Add** select 'Protocol' and click **Add** again. In the next dialog box under 'Manufacturer' select 'Microsoft' and under 'Network Protocol' select 'TCP/IP'.*

③ If you use a router for Internet access, you will still need to configure it, because the router dials into the Internet, not the computer. Under **Start** ▶ **Settings** ▶ **Control Panel** ▶ **Internet Options** select the 'Connections' tab and enable the 'Never dial a connection' option. Close the dialogs with **OK**.

5.1.2 Windows 2000

① Open the properties of the LAN connection on the connected computers by selecting **Start** ▶ **Settings** ▶ **Control Panel** ▶ **Network and Dial-up Connections**. Click with the right mouse button on the corresponding LAN connection and select 'Properties'.

② Click the entry for the TCP/IP protocol of the network adapter and on **Properties**. Enable the 'Use the following IP address' option and enter

the 'IP address' and 'Subnet mask'. You can ignore all other options: they either remain empty or retain their default settings. Close the dialogs with **OK**.

*If you cannot find an entry similar to 'TCP/IP' or 'TCP/IP -> Network Adapter Name' or 'Internet Protocol (TCP/IP)', you must install the TCP/IP protocol. Under **Install** select 'Protocol' and click **Add**. In the next dialog box select 'Internet Protocol (TCP/IP)' and confirm with **OK**.*

③ If you use a router for Internet access, you will still need to configure it, because the router dials into the Internet, not the computer. Under **Start ▶ Settings ▶ Control Panel ▶ Internet Options** select the 'Connections' tab and enable the 'Never dial a connection' option. Close the dialogs with **OK**.

5.1.3 Windows XP

The Windows XP start menu can be configured in different ways. See the Windows XP documentation for more information.

① Open the properties of the LAN connection on the connected computers. Select **Start ▶ Control Panel ▶ Network and Internet Connections ▶ Network Connections**. Click with the right mouse button on the corresponding LAN connection and select 'Properties'.

② Click the entry for the TCP/IP protocol of the network adapter and on **Properties**. Enable the 'Use the following IP address' option and enter the 'IP address' and 'Subnet mask'. You can ignore all other options: they either remain empty or retain their default settings. Close the dialogs with **OK**.

*If you cannot find an entry similar to 'TCP/IP' or 'TCP/IP -> Network Adapter Name' or 'Internet Protocol (TCP/IP)', you must install the TCP/IP protocol. Under **Install** select 'Protocol' and click **Add**. In the next dialog box select 'Internet Protocol (TCP/IP)' and confirm with **OK**.*

③ If you use a router for Internet access, you will still need to configure it, because the router dials into the Internet, not the computer. Under **Start ▶ Control Panel ▶ Network and Internet Connections ▶ Internet Options** select the 'Connections' tab and enable the 'Never dial a connection' option. Close the dialogs with **OK**.

EN

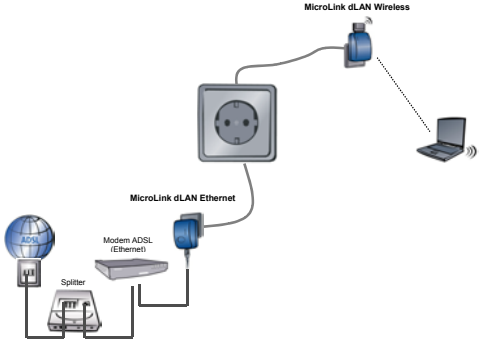
Other Internet applications such as e-mail clients may also need this information. This generally involves changing a setting with a name like 'Connect to' or similar to 'LAN'.

5.2 Examples of applications

This section demonstrates current application scenarios.

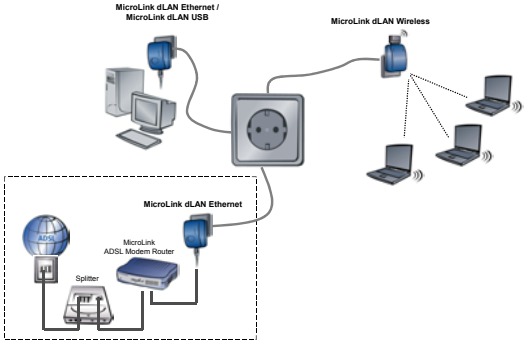
5.2.1 WLAN individual installation solution—Option 1

WLAN workstation with an ADSL Internet connection via dLAN



5.2.2 Home networking—Option 2

Networking multiple WLAN and dLAN workstations with an Internet connection using a modem router



EN

5.3 Worth knowing

Network volume

The maximum number of dLAN adapters in a single-family house is theoretically 253 connections, but in practice no more than 10 devices should be transferring data simultaneously.

Compatibility

The MicroLink dLAN Wireless by devolo is compatible to all other devolo LAN products, to all devices conforming to the IEEE 802.3 standard and to other HomePlug devices.

Network security

Normally, the electric meter acts a physical barrier, i.e. only dLAN devices connected to this electrical meter can be within the network and benefit from the phase coupling. For the sake of security, a 56-bit encryption is used to guarantee secure data transfer within the network. In addition, we highly recommend using the WEP encryption. For further information, please refer to the previous chapters on 'devolo MicroLink dLAN Software' and 'Network configuration'.

How to use passwords correctly

You can improve your security substantially by following some important rules regarding the use of passwords.

- Keep your passwords as secret as possible.
  - Never write a password down. Popular, but completely unsuitable storage options include notebooks, wallets and text files in computers. Do not pass on your password unnecessarily.
- Select a random password.
  - Use random strings of letters and numbers. Passwords from common language usage are not secure.
- Change the password regularly or immediately if you feel it has been compromised.
  - Passwords should be changed as frequently as possible. This requires a little effort, but increases your security considerably.
  - Even if only the slightest indication of a leak exists, the password should be changed.

For security reasons, the device's internal 56-bit encryption is used. Furthermore, we highly recommend using the WEP encryption. You can configure both encryption methods using the MicroLink dLAN Configuration Wizard and the configuration interface. For more information, refer to the chapter on 'Network configuration'.

You can find more answers to frequently asked questions (FAQs) on the devolo product CD (included) and at our home page www.devolo.com.

EN

6 Appendix

6.1 Technical data

This table has detailed information for those interested.

	MicroLink dLAN Wireless
Standards	Wireless specification IEEE 802.11b Compatible to HomePlug standard
Protocols	CSMA/CD
Transmission rates	14 Mbps via power network 11 Mbps via wireless network
Transmission procedures	Asynchronous
Modulation	OFDM—84 Carrier DSSS via wireless
Range	Up to 200 m via power network Up to 400 m via wireless network
Security	56-bit encryption (DES) via power network WEP encryptionvia wireless network
LEDs	WLAN (Tx/Rx) dLAN (Link/Act/Col)
dLAN connection	Standard power plug
Laptop interface	Wireless card
Power consumption	Max. 6 W
Power supply	Integrated power supply via power socket Rated voltage: 230 VAC Rated current: 0.026 A Rated frequency: 50/60 Hz
Temperature	Storage: -25°C – 70°C; operation: 0°C – 40°C
Environment	0-40°C, 10-90% humidity (non-condensing)
System requirements	Wireless interface Windows 98, Windows Me, Windows 2000, Windows XP and all TCP/IP systems
CE conformity	CE-compliant in accordance with the technical requirements of R&TTE for all EU countries and Switzerland
Design	Plastic housing; 93 x 66 x 42 (height x width x depth)
Warranty	3 years

EN

6.2 Declaration of conformity

CE

KONFORMITÄTSERKLÄRUNG

EC DECLARATION OF CONFORMITY

Die Firma: **devolo AG**
The Company: **Sonnenweg 11**
52070 Aachen

erklärt, dass das Produkt: **MicroLink dLAN™ Wireless**
declares that the product:

Verwendungszweck: **WirelessLAN HomePlug Access Point**
Intended purpose: WirelessLAN HomePlug Access Point

den grundlegenden Anforderungen des § 3 und den übrigen einschlägigen Bestimmungen des FTEG (Artikel 3 der R&TTE) entspricht.
complies with the appropriate essential requirements of the FTEG (Article 3 of R&TTE) and the other relevant provisions.

Harmonisierte Normen: Gesundheit und Sicherheit gemäß §3 (1) 1. (Artikel 3 (1) a))
Harmonised standards: Health and safety requirements contained in §3 (1) 1. (Article 3 (1) a))

EN 60950: 2000

Harmonisierte Normen: Schutzanforderungen in Bezug auf die EMV §3 (1) 2, (Artikel 3 (1) b)
Harmonised standards: Protection requirements with respect to EMC §3 (1) 2, (Article 3 (1) b)

EN 55024:1998 +A1: 2001
EN 55 022: 1998 +A1: 2000 and Expert Opinion by Competent Body EMC (CE 0682)
EN 300 328-2 V1.2.1, EN 301 489-1 V1.4.1, EN 301 489-17 V1.1.1

Diese Erklärung wird verantwortlich abgegeben durch:
This declaration is submitted by:

Aachen, 25. November 2003
Aachen, 25th November 2003

Heiko Harbers
Vorstandsvorsitzender
CEO

EN

6.3 Warranty conditions

The devolo AG warranty is given to purchasers of devolo products in addition to the warranty conditions provided by law and in accordance with the following conditions:

1 Warranty coverage

a) The warranty covers the equipment delivered and all its parts. Parts will, at devolo's sole discretion, be replaced or repaired free of charge if, despite proven proper handling and adherence to the operating instructions, these parts became defective due to fabrication and/or material defects. Alternatively, devolo reserves the right to replace the defective product with a comparable product with the same specifications and features. Operating manuals and possibly supplied software are excluded from the warranty.

b) Material and service charges shall be covered by devolo, but not shipping and handling costs involved in transport from the buyer to the service station and/or to devolo.

c) Replaced parts become property of devolo.

d) devolo is authorized to carry out technical changes (e.g. firmware updates) beyond repair and replacement of defective parts in order to bring the equipment up to the current technical state. This does not result in any additional charge for the customer. A legal claim to this service does not exist.

2 Warranty period

The warranty period for this devolo product is three years. This period begins at the day of delivery from the devolo dealer. Warranty services carried out by devolo do not result in an extension of the warranty period nor do they initiate a new warranty period. The warranty period for installed replacement parts ends with the warranty period of the device as a whole.

3 Warranty procedure

a) If defects appear during the warranty period, the warranty claims must be made immediately, at the latest within a period of 7 days.

b) In the case of any externally visible damage arising from transport (e.g. damage to the housing), the person carrying out the transportation and the sender should be informed immediately. On discovery of damage which is not externally visible, the transport company and the sender are to be immediately informed in writing, at the latest within 3 days of delivery.

c) Transport to and from the location where the warranty claim is accepted and/or the repaired device is exchanged, is at the purchaser's own risk and cost.

d) Warranty claims are only valid if a copy of the original purchase receipt is returned with the device. devolo reserves the right to require the submission of the original purchase receipt.

4 Suspension of the warranty

All warranty claims will be deemed invalid

a) if the label with the serial number has been removed from the device,

b) if the device is damaged or destroyed as a result of acts of nature or by environmental influences (moisture, electric shock, dust, etc.),

c) if the device was stored or operated under conditions not in compliance with the technical specifications,

d) if the damage occurred due to incorrect handling, especially to non-observance of the system description and the operating instructions,

e) if the device was opened, repaired or modified by persons not contracted by devolo,

f) if the device shows any kind of mechanical damage, or

g) if the warranty claim has not been reported in accordance with 3a) or 3b).

5 Operating mistakes

If it becomes apparent that the reported malfunction of the device has been caused by unsuitable hardware, software, installation or operation, devolo reserves the right to charge the purchaser for the resulting testing costs.

6 Additional regulations

a) The above conditions define the complete scope of devolo's legal liability.

b) The warranty gives no entitlement to additional claims, such as any refund in full or in part. Compensation claims, regardless of the legal basis, are excluded. This does not apply if e.g. injury to persons or damage to private property are specifically covered by the product liability law, or in cases of intentional act or culpable negligence.

c) Claims for compensation of lost profits, indirect or consequential detriments, are excluded.

d) devolo is not liable for lost data or retrieval of lost data in cases of slight and ordinary negligence.

e) In the case that the intentional or culpable negligence of devolo employees has caused a loss of data, devolo will be liable for those costs typical to the recovery of data where periodic security data back-ups have been made.

f) The warranty is valid only for the first purchaser and is not transferable.

g) The court of jurisdiction is located in Aachen, Germany in the case that the purchaser is a merchant. If the purchaser does not have a court of jurisdiction in the Federal Republic of Germany or if he moves his domicile out of Germany after conclusion of the contract, devolo's court of jurisdiction applies. This is also applicable if the purchaser's domicile is not known at the time of institution of proceedings.

h) The law of the Federal Republic of Germany is applicable. The UN commercial law does not apply to dealings between devolo and the purchaser.